

CURRICULUM VITAE

(as of 1/10)

WILLIAM ANDREW BENNETT

Address: University of California, Davis
Center for Watershed Sciences,
John Muir Institute of the Environment,
Bodega Marine Laboratory
P.O. Box 247
Bodega Bay, California 94923

Phone: (707)-875-1979
FAX : (707)-875-2089
Internet: wabennett@ucdavis.edu

EDUCATION

Ph.D. in Ecology 1993
University of California, Davis, CA
Dissertation: Interaction of food limitation, predation, and anthropogenic intervention on larval striped bass in the San Francisco Bay estuary.

M.S. in Population Biology 1984
University of Massachusetts, Boston, MA
Thesis: Scale of investigation and the detection of competition: an example from two finch species introduced into North America.

B.S. in Biology 1980
University of Massachusetts, Boston, MA
Senior Undergraduate Honors Thesis: Competition in three bird species.

PROFESSIONAL EXPERIENCE

2006-present, Associate Research Ecologist I, Center for Watershed Sciences, John Muir Institute of the Environment, University of California, Davis.

1999-2005, Assistant Research Ecologist IV, Center for Watershed Sciences, John Muir Institute of the Environment, University of California, Davis.

1994-1999, Postgraduate Researcher, Bodega Marine Laboratory, University of California, Davis

1991-present, Committee Member, Interagency Ecological Program for the San Francisco Estuary. Estuarine Ecology, Suisun Bay/Entrapment Zone, Contaminant Effects, Delta Smelt, and Pelagic Organism Decline, Project Work Teams.

1995 (Summer), Environmental Protection Specialist, U.S. Environmental Protection Agency, 75 Hawthorn Street, San Francisco, California.

1991-1994, Postgraduate Researcher, Dept. Wildlife, Fish, and Conservation Biology, UC-Davis.

1987-1991, Research Assistant, Dr. Peter Moyle, Dept. Wildlife, Fish, and Conservation Biology, UC-Davis.

1981-1982, Research Assistant, Dr. Richard Levins, Dept. Population Studies, Harvard School of Public Health, Boston, MA.

1975-1986, Carpenter, Self-employed

1965-1984, Machinist, Custom Machine & Tool Company (Family Business), 22 Station Street, P.O. Box 890040, East Weymouth, MA 02189-0001.

PUBLICATIONS (REFEREED)

1. **Bennett, W.A.** 1990. Scale of investigation and the detection of competition: an example from the house sparrow and house finch introductions in North America. *American Naturalist* 135: 725-747.
2. Brown, L.R., P.B. Moyle, **W.A. Bennett**, and B.D. Quilley. 1992. Implications of morphological variation among populations of California roach *Lavinia symmetricus* (Cyprinidae) for conservation policy. *Biological Conservation* 62:1-10.
3. **Bennett, W.A.**, D.J. Ostrach, and D.E. Hinton. 1995. Condition of larval striped bass in a drought-stricken estuary: evaluating pelagic food web limitation. *Ecological Applications*. 5: 680-692.
4. Rogers-Bennett, L., **W.A. Bennett**, H.C. Fastenau, and C.M. Dewees. 1995. Spatial variation in red sea urchin reproduction and morphology: implications for harvest refugia. *Ecological Applications* 5:1171-1180.
5. **Bennett, W.A.** and P.B. Moyle. 1996. Where have all the fishes gone?: factors producing fish declines in the San Francisco Bay estuary. In, *San Francisco Bay: the Ecosystem*. J.T. Hollibaugh, editor. Pacific Division, American Association for the Advancement of Science, San Francisco, California.
6. Kimmerer, W.J., J. Burau, and **W.A. Bennett**. 1998. Tidally-oriented migration and position maintenance of zooplankton in northern San Francisco Bay. *Limnology and Oceanography* 43: 1697-1709.
7. **Bennett, W.A.**, W.J. Kimmerer, and J.R. Burau. 2002. Plasticity in vertical migration by native and exotic estuarine fishes in a dynamic low-salinity zone. *Limnology and Oceanography* 47: 1496-1507.
8. Kimmerer, W.J., J. Burau, and **W.A. Bennett**. 2002. Persistence of tidally-oriented vertical migration by zooplankton in a temperate estuary. *Estuaries* 25:359-371.
9. Rogers-Bennett, L., D.W. Rogers, **W.A. Bennett**, and T.A. Ebert. 2003. Modeling red sea urchin growth using six growth functions. *U.S. Fishery Bulletin* 101: 614-626.
10. **Bennett, W.A.**, K. Roinestad, L. Rogers-Bennett, L.S. Kaufman, B. Heneman. 2004. Inverse regional responses to climate change and fishing intensity by the recreational rockfish (*Sebastes*, spp.) fishery in California. *Canadian Journal of Fisheries and Aquatic Sciences* 61:2499-2510.
11. Fujiwara, M., B.E. Kendall, R.M. Nisbet, and **W.A. Bennett**. 2005. Analysis of size trajectory data using an energetic-based growth model. *Ecology* 86:1441-1451.
12. **Bennett, W.A.** 2005. Critical assessment of the delta smelt population in the San Francisco Estuary, California. *San Francisco Estuary and Watershed Science*. 3(2): 71pgs. (<http://repositories.cdlib.org/jmie/sfews/vol3/iss2/art1/>)
13. Hobbs, J.A., Q. Yin, J. Burton-Hobbs, and **W.A. Bennett**. 2005. Retrospective determination of natal habitats for an estuarine fish with otolith strontium isotope ratios. *Journal of Freshwater and Marine Research*. 56: 655-660.
14. Anderson, S.L., G.N. Cherr, S.G. Morgan, C.A. Vines, R.M. Higashi, **W.A. Bennett**, W.L. Rose, A.J. Brooks and R.M. Nisbet. 2006. Integrating contaminant responses in indicator saltmarsh species. *Marine Environmental Research* 62:S317-S321.
15. Hobbs, J.A. **W.A. Bennett**, and J. Burton-Hobbs. 2006. Assessing nursery habitat quality for native fishes in the low-salinity zone of the San Francisco Estuary, California. *Journal of Fish Biology* 69:

16. Hobbs, J.A., **W.A. Bennett**, and J. Burton-Hobbs. 2007. Modification of the biological intercept model to account for otogenetic effects in laboratory-reared delta smelt (*Hypomesus transpacificus*). U.S. Fishery Bulletin. 105:30-38.
17. Hobbs, J.A., **W.A. Bennett**, J. Burton-Hobbs, M. Gras. 2007. Classification of larval and adult delta smelt to nursery areas by use of trace elemental fingerprinting. Transactions of the American Fisheries Society 136:518-527.
18. Bano, N., A. deRae Smith, **W.A. Bennett**, L. Vasquez, and J.T. Hollibaugh. 2007. Dominance of Mycoplasma in the guts of the long-jawed mudsucker, *Gillichthys mirabilis*, from five California salt marshes. Environmental Microbiology 9: 2636-2641.
19. Feyrer, F., J. Hobbs, M. Baerwald, T. Sommer, Q. Yin, K. Clark, B. May, and **W.A. Bennett**. 2007. Otolith microchemistry provides information complementary to microsatellite DNA for a migratory fish. Transactions of the American Fisheries Society 136: 469-476.
20. McGourty, C.R., J.A. Hobbs, **W.A. Bennett**, P.G. Green, H-M. Hwang, N. Ikemiyagi, L. Lewis, J.M. Cope. 2009. Likely population-level effects of contaminants on a resident fish species: comparing *Gillichthys mirabilis* population static measurements and vital rates in San Francisco and Tomales Bays. Estuaries and Coasts 32:1111-1120.
21. Lund, J., E. Hanak, W. Fleenor, **W. A. Bennett**, R. Howitt, J. Mount, and P. Moyle. 2010. Comparing Futures for the Sacramento-San Joaquin Delta. University of California Press, Berkeley, CA.
22. Thompson, J., W. Kimmerer, L. Brown, K. Newman, R. MacNally, **W. Bennett**, F. Feyrer, E. Fleishman. Bayesian change-point analysis of abundance trends for pelagic fishes in the upper San Francisco Estuary. Ecological Applications (*In Press*).
23. MacNally, R., J. Thompson, J., W. Kimmerer, F. Feyrer, K. Newman, A. Sih, **W. Bennett**, L. Brown, E. Fleishman, S. Culberson, G. Castillo. An analysis of pelagic species decline in the upper San Francisco Estuary using multivariate autoregressive modeling (MAR). Ecological Applications (*In Press*).

MANUSCRIPTS SUBMITTED & IN PREPARATION

1. Moyle, P. and W.A. Bennett. Habitat variability and complexity in the upper San Francisco Estuary. San Francisco Estuary and Watershed Science (*Submitted*).
2. Bennett, W.A., J.A. Hobbs, S.J. Teh. Selection via large-scale water extraction accelerates decline of an endangered estuarine smelt: Where's your Big-Mama? Ecology Letters (*In preparation*).
3. Bennett, W.A., J.A. Hobbs, S.J. Teh. Interactive processes regulating an endangered smelt: collapse of a pelagic assemblage in a highly altered estuary: Ecological Applications. (*In preparation*).
4. Bennett, W.A., G. N. Cherr, S.L. Anderson, R.M. Nisbet, A.J. Brooks, C.A. Vines, S.J. Teh, and L.S. Lewis. Toxicology in an ecological context: assessment of tidal-marsh goby populations in California. Ecological Applications. (*In preparation*).

OUTREACH PUBLICATIONS

- Lund, J., E. Hanak, W. Fleenor, **W. A. Bennett**, R. Howitt, J. Mount, and P. Moyle. 2008. Comparing futures for the Sacramento-San Joaquin Delta. Public Policy Institute of California, San Francisco, CA. 184 pgs. (<http://www.ppic.org/main/publication.asp?i=810>).

- Moyle, P. and **W.A. Bennett**. 2008. The future of the Delta ecosystem and its fish: Technical Appendix D. In, *Comparing futures for the Sacramento-San Joaquin Delta: Technical Appendix*. Public Policy Institute of California, San Francisco, CA. 46 pgs. (http://www.ppic.org/content/pubs/other/708EHR_appendix.pdf).
- Bennett, W.A.**, G.A. Cherr, C.A. Vines, and R. Nisbet. 2006. Integrating indicators across multiple levels of biological organization: a statistical approach for developing a comprehensive index of fish condition. Final Report for U.S. EPA Science to Achieve Results (STAR) EAGLE Program. Pacific Estuarine Ecosystem Indicator Research (PEEIR) consortium. URL: http://www.bml.ucdavis.edu/peeir/brochures/Fish_Integrated_Indicators.pdf
- Kimmerer W.J. and **W.A. Bennett**. 2005. A plan for understanding the mechanisms underlying X2. Interagency Ecological Program for the San Francisco Estuary Newsletter 18 (Spring): 56-68.
- Dettinger, M., **W.A. Bennett**, D. Cayan, J. Florsheim. M. Hughes, B.L. Ingram, A. Jassby, N. Knowles, F. Malamud-Roam, D. Peterson, K. Redmond, and L. Smith. 2002. Climate science issues and needs of the CALFED Bay-Delta Program. Extended abstract submitted to the American Meteorological Society.
- Bennett, W.A.**, K. Roinestad, L. Rogers-Bennett, L.S. Kaufman, B. Heneman. 2001 Regional response of the nearshore recreational fishery to shifting climate: using historical science to identify a framework for regional management. A "whitepaper" submitted to the California Department of Fish and Game, Marine Region.
- Bennett, W.A.**, 2000. Delta smelt population structure and factors influencing dynamics: Implications for the CALFED restoration program. Draft white-paper submitted to the CALFED Ecosystem Restoration Program.
- Bennett, W.A.** 2000. Delta smelt studies: contaminant and inland silverside effects. Interagency Ecological Program for the Sacramento-San Joaquin Estuary Newsletter 13(2):8.
- Bennett, W.A.** and E. Howard, 1999. Climate change and the decline of striped bass. Interagency Ecological Program for the Sacramento-San Joaquin Estuary Newsletter 12(2):53-56.
- Bennett, W.A.** 1998. Vertical migration and retention of native and exotic larval fishes in the entrapment zone of a tidally dominated estuary. California Interagency Ecological Program, Technical Report 56. California Department of Water Resources, Sacramento, California.
- Bennett, W.A.** and E. Howard, 1997. El Ninos and the decline of striped bass. Interagency Ecological Program for the Sacramento-San Joaquin Estuary Newsletter 10(4):17-21.
- Estuarine Ecology Project Work Team (one of 12 co-authors, equal authorship). 1997. An assessment of the likely mechanisms underlying the "fish-X2" relationships. California Interagency Ecological Program, Technical Report 52. California Department of Water Resources, Sacramento, California.
- Kimmerer, W.J. and **W.A. Bennett**. 1996. Science, policy, and the Interagency Program. Interagency Ecological Program for the Sacramento-San Joaquin Estuary Newsletter 8(4):17-21.
- Bennett, W.A.** 1996. Framework for evaluating pesticide effects on fish populations. Interagency Ecological Program for the Sacramento-San Joaquin Estuary Newsletter 8(2):7-12.
- Bennett, W.A.** 1995. Potential effects of exotic inland silversides on delta smelt. Interagency Ecological Program for the Sacramento-San Joaquin Estuary Newsletter. 7(1): 4-6.

Estuarine Ecology Project Work Team (one of 12 co-authors, equal authorship). 1995. Conceptual Models for the food web of the San Francisco Bay estuary. California Interagency Ecological Program, Technical Report 42. California Department of Water Resources, Sacramento, CA

Puccia, C.J. and **W.A. Bennett**. 1982. Qualitative analysis in the setting of the east coast marine benthos. In: Environmental Biology State of the Art Seminar. U.S.E.P.A. publication #600/9-82-007.

CONFERENCES, BRIEFINGS, & WORKSHOPS

Delta Smelt Program Review, Scientific Advisory Group, Interagency Ecological Program for the San Francisco Estuary, Tiburon, CA. April 13-14, 2006.

Briefing for the Pelagic Organism Decline Management Committee, Interagency Ecological Program for the San Francisco Estuary, Sacramento, CA. March 10, 2006.

Briefing for Board of Directors, CA State Water Contractors. Sacramento, CA. January 19, 2006.

Benthic-pelagic linkages in MPA design: Exploring the application of science to vertical zoning approaches. Vertical Zoning of Marine Protected Areas. National Marine Protected Area Center, and Urban Harbors Institute, University of Massachusetts, Boston. Monterey, CA. November 15-16, 2005. (Invited Participant).

Briefing for CA State Assembly-woman Lois Wolk. John Muir Institute of the Environment, University of California, Davis. November 8, 2005.

Briefing for CA State Senator Michael Machado. John Muir Institute of the Environment, University of California, Davis. September 20, 2005.

Briefing for Directors of CA Farm Bureau Federation. Sacramento, CA. February 23, 2005.

Briefing for Directors of CALFED, CA Department of fish and Game, CA Department of Water Resources, and U.S. Fish and Wildlife Service. Sacramento, CA. February 3, 2005.

Delta Smelt Environmental Account Workshop 2004. Sponsored by CALFED Bay-Delta Authority, Davis, CA, September 8-9, 2004 (Invited Speaker & Participant).

Scientific Review of the North Delta Improvements Project (NDIP). University of California, Davis Watershed Center, and The California Nature Conservancy. University of California, Davis, April 7, 2004. (Invited Review Panel Member).

Scientific Review of the North Delta Improvements Project (NDIP). University of California, Davis Watershed Center, and The California Nature Conservancy. University of California, Davis, November 13, 2003. (Invited Review Panel Member).

CALFED Environmental Water Account review workshop. Sponsored by CALFED Science Program Sacramento, CA, October 14-16, 2003. (Invited Participant).

CALFED Delta Smelt Workshop. Sponsored by CALFED Science Program, Santa Cruz, CA, August 17-19, 2003. (Invited Speaker & Participant).

CALFED Water Operations and Environmental Protection Conference. Sponsored by CALFED Science Program, Sacramento, CA, June 18-20, 2003 (Invited Speaker & Participant).

Delta Smelt Environmental Account Workshop 2002. Sponsored by CALFED Bay-Delta Authority, Davis, CA, September 4, 2002 (Invited Speaker & Participant).

Scientific Review of the CALFED Delta-Cross-Channel Investigations. Sponsored by CALFED Ecosystem Restoration Program for the San Francisco Estuary, Courtland, CA, May 24, 2001 (Invited Review Panel Member).

CALFED Science Conference 2000. Sponsored by CALFED restoration process for the San Francisco Estuary, Sacramento, CA, October 3-5, 2000 (Co-Technical Program Chair).

Review of the CDFG Delta Outflow-San Francisco Bay Study by the Scientific Advisory Group. Sponsored by the Interagency Ecological Program, Bay Model, Sausalito, CA, October 28-29, 1999 (Invited *Ad Hoc* Review Panel Member).

Conference on the Restoration Priorities for the Endangered Delta Smelt. Sponsored by the Interagency Ecological Program and CALFED. Sacramento, CA, October 1, 1998 (Invited Speaker and Panel Member).

Use of Conceptual Models in the Design of a Comprehensive Monitoring, Assessment, and Research Program for the CALFED Process. Sponsored by CALFED. University of California, Davis, CA, June 17-18, 1998 (Invited Speaker and Panel Member).

Workshop on the X2 Salinity Standard. Sponsored by California Department of Water Resources and Metropolitan Water District. Contra Costa Water District, Concord, CA, March 11, 1998. (Invited Speaker and Panel Member).

Facilitated Scientific Review of the CALFED Bay-Delta Program's Ecosystem Restoration Plan for the San Francisco Bay-Delta estuary. Sponsored by CALFED Bay-Delta Program. Sacramento, CA, October 6-9, 1997 (Invited Technical Advisor).

Restoration of the San Francisco Bay/Delta/River: choosing indicators of ecological integrity. Workshop of estuarine scientists on restoration goals for the San Francisco Estuary." Sponsored by U.S.E.P.A. and U.C. Berkeley's Center for Sustainable Resource Development. U.C. Berkeley, October 28, 1995 (Invited Participant).

Goals for restoring a healthy estuary. Workshop of estuarine scientists on restoration goals for the San Francisco Bay estuary. Sponsored by 14 State/Federal agencies, environmental, and industrial organizations. Romburg Tiburon Center for Environmental Studies, Tiburon, CA, October 2, 1995 (Invited Participant).

TEACHING EXPERIENCE

2005-present. Guest lecturer, **Marine Ecology & Conservation**. Ecology Graduate Group, University of California, Davis.

1987 (Fall). Teaching Assistant and Lecturer, **Wildlife Ecology and Conservation**. Dept. Wildlife, Fish, and Conservation Biology, UC-Davis.

1985 (Summer) Teaching Fellow, **Marine Biology**. Introduction to marine systems emphasizing evolutionary ecology and behavior of local invertebrates. Museum of Comparative Zoology, Harvard University, Cambridge, MA.

1985 (Spring) Lecturer, **Marine Invertebrate Zoology Laboratory**. Field and laboratory exercises emphasizing taxonomy, life history and evolutionary ecology of marine invertebrates. Dept. Biology, University of Massachusetts, Boston, MA.

1984 (Fall) Lecturer, **Ecology Laboratory**. Field and laboratory exercises emphasizing experimental design, statistical analyses, and report writing. Dept. Biology, University of Massachusetts, Boston, MA.

1981-1984 Teaching Assistant, **Evolutionary Ecological Methods and Genetics**. Dept. Biology,
University of Massachusetts, Boston, MA.

STUDENTS & UNIVERSITY SERVICE

Advisor:

James A. Hobbs, Ph.D. (2004) & Post-doctoral Fellow (2005-present). Ecology Graduate Group,
University of California, Davis (Co-advisor: Dr. Peter B. Moyle, WFCB). Thesis Title: Microscale
patterns – macroscale implications: the application of otolith microstructure and microchemistry to
assess nursery habitat quality for the threatened delta smelt in the San Francisco Estuary.

Oral Examination & Dissertation Committee:

Robert Schroeder, Ph.D.(2008) Ecology Graduate Group, University of California, Davis (Advisor: Dr.
Peter B. Moyle, WFCB)

Lenny Grimaldo, Ph.D. Candidate, Ecology Graduate Group, University of California, Davis (Advisor: Dr.
Peter B. Moyle, WFCB)

Renny Talianchich, Master's Student, Romberg Tiburon Laboratories, San Francisco State University
(Advisor: Dr. Wim Kimmerer, SFSU)

Other Committees:

Graduate Admissions Committee, 2006. Graduate Group in Ecology, UCD.

Boating Safety Committee, 2003-2006, UCD.

Academic Merit and Promotion Committees. 1999-present. John Muir Institute of the Environment, UC-
Davis.

GRANTS

CALFED Ecosystem Restoration Program. \$1,500,000. (2006-2009) Monitoring responses of the delta
Smelt population to multiple restoration actions in the San Francisco Estuary. (PI: Bennett).

CBDA Science Program. \$1,200,000 (2006-2008) Modeling the delta smelt population in the San Francisco
Estuary (PI: W. Kimmerer, SFSU).

California Interagency Ecological Program. \$950,000. (2005-2006) Application of otolith growth, histology,
and bioassay techniques to understand the decline of pelagic fishes in the San Francisco Estuary (PI
Bennett).

UC Davis Wildlife Health Center and Department of Fish and Game Resource Assessment Program (RAP).
\$49,000. (2005-2006). Reproduction and longevity of delta smelt in the San Francisco Estuary (PI
Bennett).

CALFED Ecosystem Restoration Program. \$75,000 (2004-2006) A plan for determining the
mechanisms underlying the fish-X2 relationships (PI: W. Kimmerer, SFSU).

California Interagency Ecological Program. \$99,700 (2003-2005). Feeding success of delta smelt. (PI:
Bennett and W.Kimmerer, SFSU).

U.S. Geological Survey. \$10,000 (2004) CALFED Climate Change Whitepaper (PI: Bennett)

CALFED Science Program. \$97,000 (2003-2005) The spatial ecology of

delta smelt revealed by otolith biogeochemistry. Graduate Fellowship for J.A. Hobbs (PI: Bennett).

California Interagency Ecological Program. \$35,000 (2003-2005). Learning from particle tracking models. (PIs: Bennett, W. Kimmerer SFSU, M. Nobriga CDWR).

National Fish and Wildlife Federation. \$75,000 (2001-2002) Developing a scientific basis for management of the California nearshore fisheries (PI: Bennett).

Packard Foundation. \$30,000 (2002-2003) Developing a scientific basis for management of the California nearshore fisheries (PI: Kaufman, Co-PI: Bennett).

California Department of Fish and Game \$25,000 (2002-2003). Review of fishery independent data sources for near-shore fishes in support of the Marine Life Management Act (PI: Bennett).

U.S Environmental Protection Agency. \$6,000,000 (2000-2005). Western Center for Estuarine Ecosystem Indicator Research (PI: Susan Anderson, BML, Co-PI: Bennett with several others)

Sonoma County Fish and Wildlife Advisory Board. \$12,000 (2000-2001) Growth assessment of fishes in support of fisheries management on the Sonoma coast (PI: Bennett).

CALFED Ecosystem Restoration Program. \$109,000 (2000-2004) Effects of introduced species in the food web of the San Francisco Bay-Delta (PI: Kimmerer, SFSU, Co-PI: Bennett).

California Interagency Ecological Program. \$70,000 (2000-2001). Evaluating the effects of exotic inland silversides on the endangered delta smelt (PI: Bennett).

California Interagency Ecological Program. \$170,000 (2000-2001). Ecological role of Grizzly Bay as shallow-water nursery habitat for resident fishes (PI: Bennett).

CALFED Ecosystem Restoration Program. \$437,000 (1999-2001). Influence of genetic and tissue condition on individual growth rates and population dynamics of the endangered delta smelt (PI: Bennett).

California Interagency Ecological Program. \$70,000 (1998-1999). Evaluating the effects of exotic inland silversides on the endangered delta smelt, and exotic bivalves on zooplankton (PI: Bennett).

U.S. Bureau of Reclamation. \$25,000 (1998). Establishment of research and monitoring priorities for the CALFED Restoration Process for the San Francisco estuary (PI: Bennett).

California Interagency Ecological Program. \$43,000 (1998-1999). Interaction of hydrodynamics and behavior of larval fish in the entrapment zone of the San Francisco Bay Estuary (PI: Bennett).

U.S. Bureau of Reclamation. \$50,000 (1997). Cooperative Agreement with USBR to conduct special projects (PI: Bennett).

U.S. Bureau of Reclamation. \$29,929 (1996-1997). Potential emigration and the decline in striped bass abundance following the 1976-1977 drought in the San Francisco Bay/Delta. (PI: Bennett).

California Interagency Ecological Program. \$40,489 (1996-1997). Interaction of hydrodynamics and behavior of larval fish in the entrapment zone of the San Francisco Bay Estuary under high-outflow conditions. (PI: Bennett).

California Interagency Ecological Program. \$26,215 (1995-1996). Interaction of hydrodynamics and behavior of larval fish in the entrapment zone of the San Francisco Bay Estuary under high-outflow conditions. (PI: Bennett).

California Interagency Ecological Program. \$26,215 (1994-1995). Interaction of hydrodynamics and

behavior of larval fish in the entrapment zone of the San Francisco Bay Estuary under low-outflow conditions. (PI: Bennett).

California Department of Water Resources. \$24,917 (1993-1994). Intraguild predation by exotic fish and low outflow as co-factors influencing the decline of delta and longfin smelt. (Bennett wrote grant and was responsible for research. Dr. P.B. Moyle, Dept. Wildlife, Fish, and Conservation Biology, UC-Davis, served as P.I.).

California Water Resources Control Board. \$110,000 per year (1991-1994). Morphometric and histopathologic condition of larval striped bass. (Bennett wrote grant and was responsible for research. Dr. D.E. Hinton, Dept. of Medicine, UC Davis, served as P.I.).

California Interagency Ecological Program, Academic Involvement Research Program for the San Francisco Bay estuary. \$33,000 (1992). Interactive effects of starvation and predation on larval striped bass: field experiments using mesocosms. (Bennett wrote grant and was responsible for research. Dr. P.B. Moyle, Dept. Wildlife, Fish, and Conservation Biology, UC Davis, served as P.I.)

California Department of Water Resources. \$110,000 per year (1988-1990). Larval striped bass condition studies and North Bay Aqueduct larval fish monitoring. (Bennett wrote grant and was responsible for research. Dr. P.B. Moyle and Dr. D.E. Hinton, served as Co-P.I.'s).

AWARDS & SCHOLARSHIPS

R. Merton Love Student Seminar Award. (1993) Stripers, silversides, and smelt: food web and human impacts on the San Francisco Bay estuary. Ecology Graduate Group, University of California, Davis.

Marin Rod & Gun Club Scholarship. (1989) Changes in the food web enhancing the decline of striped bass in the San Francisco Bay estuary.

PROFESSIONAL SOCIETIES & SERVICE

Ecological Society of America
Estuarine Research Federation
American Fisheries Society
Western Society of Naturalists

Associate Editor, San Francisco Estuary and Watershed Science (2008-present)

SELECTION OF INVITED & CONTRIBUTED SEMINARS

Delta smelt and the POD: a series of unfortunate events? Annual Conference of the California Interagency Ecological Program for the San Francisco Bay Estuary. Asilomar, CA, March 3-5, 2005. (Invited).

Is the delta smelt a canary? Natural and anthropogenic impacts on California coastal and Delta fisheries. **Coastal Environments and River Deltas at Risk Seminar Series**, John Muir Institute of the Environment, Public Service Research Program, and the International House, UC Davis. January 11, 2006 (Invited).

Climate shift influences on striped bass, delta smelt, and the near-shore rockfish fishery. **UC Davis, Climate Change Symposium: Challenges and Solutions for California Agricultural Landscapes**. Davis, CA, May 12-13, 2005 (Invited).

Stage-based projection models for the delta smelt population. **CA Environmental Water and Modeling Forum**. Annual Asilomar Conference, Pacific Grove, CA, March 1-3, 2005. (Invited).

The state of delta smelt science. **Annual Conference of the California Interagency Ecological Program for the San Francisco Bay Estuary**. Asilomar, CA, March 3-5, 2005.(Invited).

One fish, two fish, three fish, four: estimating abundance and mortality for the threatened delta smelt. **CALFED Science Conference**, Sacramento CA, October 4-6, 2004.

Recent discoveries that may help us manage delta smelt and water operations in the San Francisco Estuary. **Association of California Water Agencies 2004 Spring Conference**. Monterey, CA, May 5, 2004. (Invited).

Estimating the abundance of the threatened delta smelt population in the San Francisco Estuary: counting from afar with myopia. **CA Estuarine Research Section (CAERS), Estuarine Research Federation annual meeting**, Bodega Marine Laboratory, Bodega Bay, March 23-25, 2004.

Climate change and fish populations from estuaries to the nearshore ocean: unveiling the invisible present. **School of Fisheries and Ocean Sciences, University of Alaska, Juneau**. April 16, 2004. (Invited).

An integrated approach for assessing contaminant effects on fish populations. **CALFED Contaminant Effects Workshop**, Sacramento, CA, February 4, 2004 (Invited).

Can we separate human from natural influences on fish populations in the estuary? **6th Biennial State of the San Francisco Bay-Delta Estuary Conference**, Oakland, CA, October 21-23, 2003. (Invited).

Effects of climate change on fish populations in the San Francisco Estuary. **Estuarine Research Federation, Biannual Conference**. Seattle, WA. September 14-18, 2003.

Is recruitment success of delta smelt, *Hypomesus transpacificus*, limited in the larval or juvenile stage? **American Fisheries Society, Early Life History Symposium**, Santa Cruz, August 21-23, 2003

Climate change and fisheries management from estuaries to the near shore ocean: unveiling the invisible present. **U.S. Geological Survey Seminar Series**, Menlo Park, CA. March 27, 2003. (Invited).

Effects of climate change on fish populations of the San Francisco Estuary. **CALFED Science Conference**, Sacramento, CA, January 14-16, 2003.

Integrated monitoring to understand the health, survival, and population dynamics of delta smelt. **CALFED Science Conference**, Sacramento, CA, January 14-16, 2003.

Acquiring essential fishery information under the Marine Life Management Act: an example from the nearshore fishery. **California and the World Ocean Conference**, Santa Barbara, CA, October 27-30, 2002

State of knowledge of delta smelt and implications for the Environmental Water Account. **CALFED Science Program Review Workshop on Environmental Water Account**, Sacramento, CA, October 21-22, 2002 (Invited).

Tissues and tummys: field measurement of stressors to understand delta smelt population dynamics. **2002 CALFED Delta Smelt Workshop**, UC- Davis , CA, September 4, 2002 (Invited)

Science challenges for understanding threats to delta smelt. **Water Operations and Environmental Protection in the Delta**. CALFED Science Program Briefing Workshop for Bennett Raley (USDOJ) and Mary Nichols (CRA), Sacramento, CA, April 22-23, 2002 (Invited)

Factors Influencing the population dynamics of delta smelt. **Workshop on delta smelt and the CALFED Environmental Water Account**, Ryde, CA, October 25-27, 2001 (Invited)

Interactive effects of food web alterations and contaminant exposure on fish populations in the San Francisco Estuary: identifying the relevance of ecological indicators. **2001 EMAP Symposium, U.S. EPA**, Pensacola Beach, FLA, April 24-27, 2001 (Invited)

Longevity, behavior, and factors influencing the dynamics of the delta smelt population in the San Francisco Estuary. **Annual Conference of the American Fisheries Society, CalNeva Chapter**. Ventura, CA. March 30-April 1, 2000. (Invited).

Delta smelt: what's going on? **Annual Conference of the California Interagency Ecological Program for the San Francisco Bay Estuary**. Asilomar, CA, February 29-March 3, 2000.(Invited).

Climate change versus human interventions and the decline striped bass in the San Francisco estuary. **Seminar Series on the San Francisco Estuary, Department of Environmental Sciences and Policy, University of California, Davis**, Davis, CA. April 28, 1999. (Invited).

Interactive role of climate change, food web processes, and human interventions on fish populations in an urbanized estuary. **Seminar Series, Institute of Marine Sciences, University of California, Santa Cruz**. Santa Cruz, CA. March 17, 1999. (Invited).

Effects of intraguild predation on the endangered delta smelt. **Annual Conference of the American Fisheries Society, CalNeva Chapter**. Sacramento, CA. April 24-25, 1998. (Invited).

Climate change and the management of fish populations in the San Francisco estuary. **14th International Conference of the Estuarine Research Federation**. Providence, Rhode Island, October 12-16, 1997 (invited).

Climate change, policy, and the decline of California's striped bass population. **Annual Conference of the California Interagency Ecological Program for the San Francisco Bay Estuary**. Asilomar, CA, February 27-March 1, 1997.(invited)

Vertical migration and retention of larval fishes in the estuarine turbidity maximum of a tidally dominated estuary. **American Society of Limnology and Oceanography Annual Conference**, Santa Fe, New Mexico, February 10-14, 1997 (invited).

Physical hydrodynamics, exotic species, and fish recruitment in the San Francisco Bay estuary. **Friday Harbor Laboratories Seminar Series**, Friday Harbor, WA, August 21, 1996 (invited).

Evaluating the effects of agricultural pesticides on fish populations in the San Francisco estuary: ships that pass in the night? **Annual Conference of the California Interagency Ecological Program for the San Francisco Bay estuary**. Asilomar, CA, February 27- March 1, 1996.

Habitat selection by larval fishes in an estuary: the interaction of hydrodynamics and larval behavior. **Bodega Marine Laboratory Research Seminar Series**, Bodega Bay, CA August 15, 1995.

Food web and human factors affecting fish recruitment processes in the San Francisco estuary. **Institute of Marine Science, University of California, Santa Cruz**, Santa Cruz, CA April 5, 1995. (Invited)

Interaction of larval fish behavior and estuarine hydrodynamics in the entrapment zone of the San Francisco Bay estuary. **Annual Conference of the California Interagency Ecological Program for the San Francisco Bay estuary**. Asilomar, CA, March 8-10, 1995. (Invited)

Potential Intraguild predation by exotic inland silversides as a factor in the decline of delta smelt in the San Francisco Bay estuary. **American Fisheries Society Conference**. Napa,CA, February 3-5, 1995.

Introduced species enter the water wars: effects of exotic inland silversides on California's threatened delta smelt. **Bodega Marine Laboratory Research Seminar Series**, Bodega Bay, CA
November 1, 1994.

Where have all the fishes gone? factors producing fish declines in the San Francisco Bay estuary. **75th Annual AAAS Conference**, San Francisco, CA, June 17-23, 1994.

Stripers, silversides, and smelt: Food web and human impacts on the San Francisco Bay estuary. **Bodega Marine Laboratory Seminar Series**, Bodega Bay, CA, February 1994. (invited)

Stripers, silversides, and smelt: Food web impacts in the San Francisco bay estuary. **Biology Colloquium, Sonoma State University**, Rohnert Park, CA, October 1993. (invited)

Interaction of food limitation and predation on mortality of larval striped bass. **San Francisco Bay and Estuarine Association**, California Academy of Sciences, San Francisco, CA, April 1993. (invited)

Evaluating the starvation hypothesis for larval striped bass using quantitative morphometry and histopathology. **11th Biennial Estuarine Research Federation Conference**, San Francisco, CA, November 1991.

Evaluating the starvation hypothesis for larval striped bass. **Natural Resource Policy Seminar Series**, Division of Environmental Studies, University of California, Davis, CA, May 1991. (invited)

Are the larvae of striped bass starving to death in the Sacramento-San Joaquin estuary? **American Fisheries Society Annual Conference**. South Lake Tahoe, Nevada, February 1990.

Scale of investigation and the detection of competition: Why house sparrows may interest marine ecologists. **Bodega Marine Laboratory Seminar Series**, Bodega Bay, CA, September 1988. (invited)

Evidence for competition between the house sparrow and house finch in North America. **Nuttall Ornithological Club, Harvard Biological Laboratory**, Cambridge, MA, October 1984. (invited)

Scale of investigation and the detection of competition: an example from two finch species introduced into North America. **Population Biologists of New England Conference**, University of Massachusetts, Amherst, MA, April 1984.